ADHD NOW

Experts today are focusing less on behaviour and more on cognitive skills. Here are some strategies to support students with ADHD.

BY JOHN HOFFMAN

"I knew I was smart, but I always felt dumb. Every once in a while I'd complete an assignment and I'd get an A on it. My teachers would write a note saying something like, 'Looking forward to seeing more work like this!' And I'd think, ' I can do it.' But then the next time I just wouldn't do the work."

James DeCarlo, age 21, is recalling what it was like to be a student with attention deficit hyperactivity disorder (ADHD), the disorder that affects one to two children in most school classes. DeCarlo, who grew up in Peterborough but now lives and works in Toronto, received a medical diagnosis of ADHD when he was eight. He struggled with school, dropping out at age 17, eight credits short of graduation.

While there is an increasing recognition that people with ADHD often have certain strengths such as energy, enthusiasm, creative outside-of-the-box thinking or the ability to hyperfocus on tasks and subjects that interest them, the disorder is still defined by areas of weakness. DeCarlo's recollection of his struggle to buckle down and work aptly illustrates the key issues in ADHD today. In the past the focus was primarily on behaviour — hyperactivity, impulsiveness and distractibility. But ADHD experts are now zeroing in on cognitive problems. In fact, ADHD is no longer even classified as a disruptive behaviour disorder.

That doesn't mean behaviour is irrelevant in ADHD; it's still part of the picture. "But we need to focus more on the cognitive side of ADHD," says Dr. Rosemary Tannock, a senior scientist at the Hospital for Sick Children and professor emerita of Special Education and psychiatry at the University of Toronto, who sat on the working group that recommended reconceptualizing ADHD as a neurodevelopmental disorder. "Supporting the cognitive functioning of children with ADHD is not only important for learning," says Tannock, who specializes in learning problems, including ADHD. "There is also emerging evidence that improving children's cognitive skills can lead to better behaviour. But the reverse is not true. Addressing behaviour problems does not improve cognitive skills."

Tannock says two key aspects of cognitive functioning are especially relevant for understanding and educating children with ADHD: executive functions and a phenomenon called cognitive load (more about that later).

SUPPORTING THINKING SKILLS IS HELPFUL FOR ALL STUDENTS, BUT PARTICULARLY THOSE WITH ADHD.

EXECUTIVE FUNCTIONS

Many teachers will be familiar with executive functions (EF): the thinking skills that enable us to make and execute plans, pay attention, regulate our emotions, and monitor our thoughts and actions. One aspect of EF that is particularly relevant to ADHD is working memory, the temporary mental bulletin board that helps us use and connect multiple bits of information at the same time. "Many, though not all, children with ADHD have problems with working memory," says Tannock. On top of that, they tend to process information more slowly than their peers. "Slow processing speed makes working memory problems even worse," says Tannock. "Working memory affects children's ability to control attention, ignore distractions and complete what they set out to do."

In her research-into-practice monograph *The Educational Implications of Attention Deficit Hyperactivity Disorder* (published by the Ontario Ministry of Education's Literacy and Numeracy Secretariat), Tannock argues that the keys to improving the school performance of students with ADHD boil down to two main goals: (1) Supporting and improving executive functions through modified instruction, and (2) Teaching practices that reduce and/or mitigate problems caused by poor working memory.

Retired Toronto principal Cheryl Paige, OCT, was ahead of the curve on improving executive functions at Joyce Public School. In fact, she made it a cornerstone of her strategy to improve student achievement when she first came to the high-needs school in 2001.

Paige, who had spent considerable time educating herself about ADHD, says supporting EF was helpful for all students, but it was particularly helpful for children with ADHD. "Many children with ADHD are at grade level on some academic skills, but they are behind in EF," she says. "So I thought that if we could support and enhance executive functioning, we could improve the performance of students who were struggling."

Apparently it worked. On Paige's watch student achievement at Joyce Public School rose tremendously. For example, the percentage of Grade 3 students achieving level three or four on EQAO math tests went from 42 per cent in 2002 to 74 per cent in 2005 and 89 per cent in 2012. Paige and her staff won many teaching awards during that time.

Supporting EF has two goals: compensating for EF weakness in order to help students learn and get their work done, and putting structures and systems in place that help children gradually build EF skills as their brains mature. While the implementation of some of these strategies may depend on classroom space and board policy, here are some of the ways to support EF that Tannock, Paige and other teachers recommend.

Minimize Distractions

While this may seem obvious, Allison Caldwell, OCT, a psycho-educational consultant with the Grand Erie District School Board, and previously with the Brant Haldimand Norfolk Catholic District School Board, is surprised when she sometimes sees students with ADHD sitting near the back of the class in the midst of a group of students who are likely to distract them.

"I'd put the student close to the teacher so the teacher can provide seamless support, including more frequent feedback, more easily," she says.

Another, less obvious, distractor for some students is too many pictures, posters and artwork on classroom walls. Tannock recommends restricting visual supports to one wall of the classroom. "It is also helpful to organize the room into different areas: quiet areas, areas for small group discussion, and an area where students can stand or move around," she adds.

Background noise was a major distractor for DeCarlo. "Very small sounds like the noise of a paper rustling could easily and violently break my focus

from a task," he says. When asked if he'd ever had a teacher who knew how to help him function in school, DeCarlo quickly names Rachel Bemrose, OCT, the teacher who let him listen to music on headphones while he was working. "Putting on my headphones allowed me to create my own environment, free from unwanted sensory input. That allowed me to focus." Noise-cancelling headphones can have a similar effect.

Increase Physical Activity

Bemrose, who teaches Grade 7/8 at Adam Scott C.V.I. and Intermediate School in Peterborough, is a big believer in the value of physical activity for helping students with ADHD. "When we started doing Daily Physical Activity (DPA), I noticed that students were more engaged, including those who had trouble with focus and sitting still."

Paige agrees. "We arranged for students with attention problems to have at least 30 minutes of physical activity a day first thing in the morning, and we noticed that it enhanced their focus."

Last summer David Koscielniak, OCT, a Special Education teacher, purchased four exercise balls for his class of 16 students at Collège catholique Samuel-Genest in Ottawa. "All students in my class have learning disabilities and many of them have ADHD as well," says Koscielniak. "I had read about yoga balls and I thought they might help some of the more hyperactive students." Although only a couple of weeks into his experiment when interviewed, Koscielniak is intrigued by what he's seen so far. "The kids seem happier. Bouncing and moving around on the ball seems to be a stress relief for them. It's as if they were putting most of their energy into trying to sit still and concentrate. Now they have more energy for focusing on academics."

Koscielniak has one student this year who he describes as the most fidgety kid he's ever met in 21 years of teaching. "He literally bounced on that ball all day," says Koscielniak. "I was watching him and thinking, 'Does he really have to bounce that high? Or is he trying to test me?' But after I noticed that when he was on the ball, he was participating: answering questions, asking questions, helping other students."

Bemrose once had a similar student. "I got him into breakdancing. His hyperactivity was an asset in dancing," she says. Breakdancing not only helped this boy work off pent-up energy and regain focus, his desire to do well in dance also motivated him to achieve in other areas. "He was eventually selected to go to leadership camp," Bemrose says.

Tannock notes that dance, and other physical activities that require students to learn or perform a set of movements in a certain order (tai chi, karate or even "Head, Shoulders, Knees and Toes"), are of particular value because they help children learn to sequence ideas. "Knowing how to sequence ideas is a very important — but sometimes overlooked — part of executive function," she says.

Reduce Stress/Anxiety

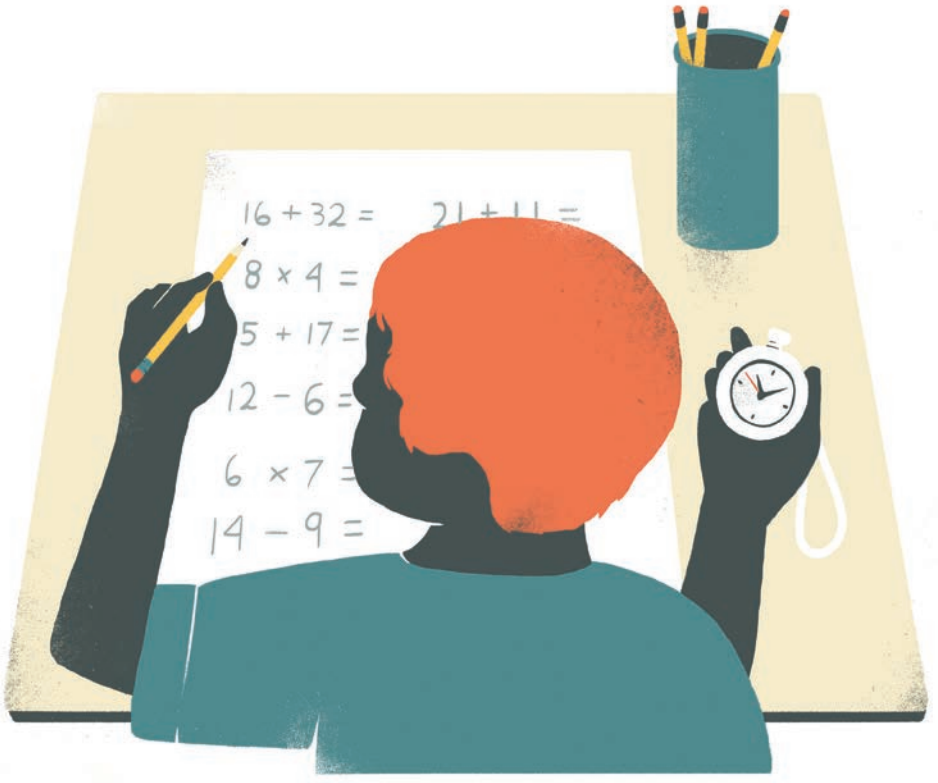
Children with ADHD are often very anxious," says Paige. "You can see the stress in their body language, even in the way they hold a pencil."

Coping with stress sucks up children's physical, emotional and cognitive energy. So reducing stress helps them save some

OTHER STRATEGIES TO SUPPORT EXECUTIVE FUNCTIONS

- Giving **frequent breaks**. David Koscielniak, OCT, a Special Education teacher at Collège catholique Samuel-Genest in Ottawa, likes to give mental breaks where he tells a little joke, a story from his life, shows a video clip on the Smart Board or a picture from the web that relates to the subject at hand. "That gives the students a break, as well as draws their attention back to me," he says.
- Offering **flexible or extended deadlines** to accommodate time-management problems.
- Implementing **routines** that make the day more predictable.
- Permitting **a parent or peer to scribe** for a child who has difficulty with note-taking.
- Using **teaching strategies that help children articulate their thinking process.** "Our teachers were constantly asking students, "Why did you do it that way?" or "How did you get that answer?" explains retired principal Cheryl Paige, OCT. This kind of interaction gradually builds students' metacognitive skills and moves them along the road to more self-regulated learning.

ILLUSTRATION: SÉBASTIEN THIBAULT/ANNA GOODSON



CHILDREN WITH ADHD ARE CHALLENGED WHEN IT COMES TO ESTIMATING HOW LONG IT WILL TAKE TO COMPLETE A TASK.

of that energy for learning. The challenge for teachers is tuning into the specific sources of stress for individual children. One source of stress for many students with ADHD comes from getting more than their share of negative feedback.

"Children with ADHD are often very sensitive. They've often had a lot of negative feedback." So public reprimands upset them to the point where it takes a long time for them to calm down, and as a result, they have an even harder time focusing. "We found that taking a child aside for a quiet, private talk was often more effective," says Paige. "Tapping lightly on a student's shoulder (or desk), as a reminder to get back on task, is another way to avoid public reprimands," she adds.

Use Timers

Children with ADHD are challenged when it comes to estimating how long it will take to complete a task or how long they should be spending on a certain chunk of an assignment. Timers can help them. "We say to the child, 'Here's the task. You have 20 minutes to do it and here's the timer,'" Paige explains.

Supporting and building executive functions is a long-term, ongoing project for many children, but especially those with ADHD. Tannock cautions that the strategies mentioned above may or may not be effective with individual students. "It's important for teachers to observe whether the strategy works and to ask the student whether it was helpful," she says. (For more strategies see sidebar "Other Strategies to Support Executive Functions.")

COGNITIVE LOAD

As noted earlier, working memory is an executive function — and it's a particularly important one in school. Recent research has shown that weaknesses in working memory and other aspects of EF are more strongly related to the symptom of inattention than the other classic ADHD symptoms of hyperactivity and impulsivity. What's more, working memory problems are strongly associated with difficulties in reading and math, and lower academic achievement in general.

This is where cognitive load comes into it. Cognitive load refers to the level

CHECK OUT THESE RESOURCES

TEACHADHD.CA

Designed by the Hospital for Sick Children, this website is supported by a team of health professionals and educators. It offers teachers a wealth of relevant, research-backed educational material stemming from current ADHD research to improve the learning outcomes of all students. It also includes a section on behaviour support strategies.

SAVING YOUR CHILD SAVING YOURSELF

Subtitled *Navigating Roadblocks in Managing ADHD, Asperger's and Learning Disabilities*, the book is a compilation of research and practice spanning more than 40 years. Check out *Professionally Speaking*'s review in the September 2014 issue at **oct-oeeo.ca/1KSk3uw**.

ADDITIONAL QUALIFICATIONS

Regardless of subject matter, Additional Qualification courses encourage teachers to critically explore the content in light of supporting every student they work with, including those with ADHD. The Ontario College of Teachers accredits over 370 AQs. To find an AQ visit **oct-oeeo.ca/1iOweMR**.

ENHANCED TEACHER EDUCATION PROGRAM

As well as AQ courses, the Enhanced Teacher Education Program, which was launched on September 1, 2015, includes a greater focus on helping students with special learning needs, including autism, ADHD and learning disabilities. When students feel well, they learn well.

of demand that mental activities such as learning or following instructions place on a person's working memory.

"Cognitive load includes things like the number of elements or ideas a child needs to attend to and how many connections between concepts they have to keep in mind, in order to understand or complete an assignment," says Tannock. For example, long and complex instructions create a higher cognitive load than short, simple ones.

Children with ADHD experience cognitive load more easily and often than their peers. This impairs their ability to pay attention, take in information and use other cognitive skills. DeCarlo has never heard the term "cognitive load," but describes it quite aptly. "Trying to do well was exhausting," he says. "Sometimes I could make myself do my best for half the day and then my brain would sort of fall asleep and I'd stop trying."

Tannock explains this phenomenon. "The brain consumes 20 per cent of our energy even though it constitutes less than two per cent of our body weight," she says. "That's why people with ADHD often say cognitive tasks are very tiring." Therefore, reducing cognitive load is key to addressing the working memory problems of students with ADHD.

Strategies that reduce cognitive load will differ depending on the age and stage of the child and their individual strengths and weaknesses, says Caldwell. But at the centre is finding ways to reduce the number of ideas and connections between ideas that a student has to juggle in his or her mental workspace at the same time.

Implement Scaffolding

Scaffolding, or moving a student gradually from dependence on instructional support toward working more independently, is a core strategy in teaching. It is also one of the most important strategies for reducing cognitive load in students with ADHD, says Karen Timm, OCT, vice-principal of Sir John A. Macdonald Public School in Pickering. "Scaffolding is a long-term project with students with ADHD," adds Timm.

The extra scaffolding that kids with ADHD need includes more frequent monitoring and feedback. "Students with ADHD need extra feedback about the progress and engagement with the task, the errors they have made and the things they are doing right," says Caldwell.

Timm says there is a danger in providing too much scaffolding for older students. "I've had teachers say, 'But he's 13 and he's going to be expected to work independently in high school.' But if the work and learning process is not supported every step of the way, the work often doesn't get done." When the work doesn't get done not only do students not learn the content, they don't get the experience of using the learning skills they need to succeed.

Try Chunking

"Breaking down and prioritizing tasks is a huge problem for students with ADHD," says Paige. "They also tend to have problems with sequential organization, 'What's the first, second, third and fourth thing I need to do? What is the big idea and which ideas are subordinate?' These abilities are delayed in children with ADHD, so they need us to help them identify the steps, and they need extra support and lots of practise so they can internalize the skills."

Caldwell agrees. "With students with ADHD you can't just say, 'Here's your assignment. Away you go,'" she says. "It's important to break the assignment down into tasks or steps, give the students timelines (how long they should spend on each chunk) and to give them specific, frequent feedback when they have finished each chunk."

Modify Instructions

The key here is to reduce the volume of verbal information, says Caldwell. "This means things like simplified, shorter, very explicit instructions, stopping to check for a student's understanding and repeating the information if necessary using the same words," she says. Tannock adds that it also helps to provide direct instruction on the order of operations, such as, "First do A, then do B, then C." "But make sure you have the student's attention to begin with," she says. "And be prepared to repeat each instruction, pausing after each step."

Use Visual Aids

Use anchor charts, graphic organizers and other visuals to reduce verbal memory load. This helps the student see necessary information, rather than having to keep it in mind. One of Paige's primary teachers created a wheel that sat on her desk with icons depicting all of the things a child had to do or remember before going home: Do you have your coat? Hat? Lunch box? Boots? Et cetera. "The children would touch every icon on the wheel before saying goodbye to the teacher."

What these strategies have in common is that they reduce the load on working memory. That makes it easier for the child to pay attention, tune out distractions and, ultimately, learn.

One of the smartest things Paige did in her school improvement journey may well have been to put improving achievement on the agenda at staff meetings. That included discussions about executive functions. "We would spend a few minutes at each meeting discussing how to enhance student achievement," she says.

Paige also sent teachers to ADHD conferences to learn more about how ADHD manifests itself. This enabled teachers to learn about EF together while sharing strategies and problem-solving. "It's important to get all staff involved and to share ideas and strategies," she says. "When you get teachers thinking and working together, you can achieve amazing results!" PS

OTHER STRATEGIES TO SUPPORT COGNITIVE LOAD

- Using **mnemonics**, which help students remember lists or steps in a process. For example, POWS (Pick an idea, Organize your notes, Write and Say more) will help students remember the sequence steps in the process of writing.
- Pre-teaching **new vocabulary** to reduce the load on working memory during a lesson that requires understanding of the new terms.
- Drawing increased attention to **key information** by underlining or highlighting words in text, providing notes listing key concepts, or flagging big ideas with verbal cues such as tone of voice and animated delivery.